The committee believes that the organization of stations for flying kites for meteorological purposes will be very important either in connection with or independent of aerial soundings and will fill up the wide gaps between the balloon stations. The committee decided to have ascensions made for three successive days in April and also at the end of August, 1905, and to make the times of ascent accord with the hours of observations for the morning weather charts. The committee recommends it as of the highest importance that steam vessels, both governmental and private, should be supplied with apparatus for doing kite work at sea, and that the officials of these vessels should be instructed in the necessary handling of the instruments.

The committee considers it of importance that the international observations of clouds be made strictly according to the definitions of the international classification and by experienced observers. It is especially necessary that aerial soundings should be accompanied by simultaneous observations of clouds.

The president of the committee is requested to select the best situations for mountain stations and to obtain as complete observations as are possible. The observations on mountains will be printed in connection with the records of the sounding balloons and kites.

The work of aerial exploration by means of sounding balloons and kites as well as permanent mountain stations is one that may well excite enthusiasm and emulation among the wealthy patrons of science in America. It is not necessary to leave all this work to the Carnegie Institution for Research, or to the overburdened universities, or to the regular routine of Weather Bureau methods. There is abundant room here for independent individual originality and local enterprise. The Great Plains of the Mississippi watershed offer unparalleled advantages for the highest balloon work and kite work. The Rocky Mountains on the west and the Appalachians on the east offer a host of peaks from 6000 to 15,000 feet high, some of them already crowned with hotels and dwellings where self-registering apparatus can easily be kept in operation. Similarly the numerous owners of private yachts can contribute immensely to our study of the atmosphere over the ocean, if, like Teisserenc de Bort, they will but devote their vessels, when not otherwise in use, to meteorological work on the high seas. What is especially needed is kite work and balloon work in the region of the Saragossa Sea and in sections to and fro across the equator from tropic to tropic on the Atlantic, Pacific, and Indian oceans.

We shall never know much about the atmosphere so long as we neglect these opportunities. Nor shall we ever understand the mechanics of storms and the general circulation of the atmosphere until we have enough observations throughout its whole extent to check our various hypotheses and enable us to concentrate on the one true theory.

MIRAGE AFTER SUNSET.

Under date of September 19, 1904, Mr. Charles N. Brown, of South Orange, N. J., communicates the following account of a phenomenon that was seen by himself and many others:

Our party of eleven were in camp on Staten Island, N. Y., at the edge of the bluff 400 feet east of the pavilion at Barbour's Grove (the Clark estate) on the south shore of Princess Bay, north from Keyport a mile and a half. At 8 o'clock p. m. on August 16, 1904, our attention was attracted by strange lights 400 yards out from shore. The water was still, the moon (two hours from setting) shone on our backs and the air was still with no cloud in the sky. The lights were stationary and we at once recognized the Luna Park, Dreamland, and tower lights (which we could see every night). On their left were the lights of Midland Beach, on their right was depicted a long narrow strip of seashore many miles long, very distinct on the water, with several bright lights on the extreme right. In front of Coney Island a boat moved with a light in it, apparently a rowboat with a man in it rowing. All this was seen right side up, and you can imagine how keenly we enjoyed it all and longed to reproduce it with a camera. After ten minutes during which time we went down to the beach (fourteen feet to sea-level), the vision passed suddenly away. At that moment the mirage cloud, which was before invisible, was seen. Then we saw in the usual place the real lights of Coney Island. This cloud was entirely horizontal, very narrow, black, and stationary. It began to change very shortly and some of us watched it for an hour and a half still suspended over the horizon, during which time it almost entirely disappeared and reappeared seven or eight times.

A QUADRUPLE RAINBOW.

Ciel et Terre publishes the following account of a quadruple rainbow observed at Mons, Belgium, August 31, 1904, by M. A. Bracke:

A shower had just ceased (17 h. 55 m. to 18 h. 30 m.) when a superb rainbow appeared—a complete semicircle, very broad, with magnificent colors, presenting distinctly the seven hues of the spectrum. A little above, less distinct and less broad, was the segment of an arc showing the red, the yellow, and the green. Below, and very near the large arc, was a third, having a breadth about equal to a quarter of the last, and showing but two colors—mauve-red and green. Finally, beneath this same arc was distinctly visible, but at intervals only, a fourth, colored like the one above it. The phenomenon lasted a quarter of an hour.

METEOR IN MONTANA.

The Inter-Lake of Kalispell, Mont., under date of July 14, 1905, contains the following item regarding a brilliant meteor seen there on July 8:

A brilliant meteor passed over this section last Saturday night, 12:35 seventy-fifth meridian time, Sunday, July 9, 1905, and apparently was visible over northern Montana, Idaho, and Washington. Reports from widely separated localities give practically the same account. The meteor lighted up the country like day for an instant and was so near the earth that the rush through the air was plainly heard.

REORGANIZATION OF METEOROLOGY IN AUSTRALIA.

The following paragraph from an editorial in the Daily Telegraph, Sydney, N. S. W., April 11, 1905, shows that a process of reorganization of scientific work is going on that will, we hope, be of advantage to meteorology and climatology. Now that the federal government is step by step consolidating Australian policies, we may expect that meteorology will be differentiated from astronomy and other cognate subjects, and will be allowed to stand by itself. A general meteorological office and a daily weather map of the whole continent would be a most important contribution to meteorology.

OBSERVATORY CONTROL.

Arrangements will probably shortly be made by the federal authorities to take over the astronomical and meteorological work of the various states and bring them under one controlling head with subdepartments in the states. Owing to this fact, the New South Wales minister for education does not propose to take any steps in the direction of filling the position of government astronomer and meteorologist, now made vacant through the retirement of Mr. Russell. During the past twelve months Mr. H. A. Lenehan has been acting government astronomer and Mr. H. A. Hunt acting meteorologist. The minister states that these gentlemen will continue to occupy these positions, pending the changes to be made by the federal government in taking over the observatory department.

BACK NUMBERS.

The Editor occasionally receives requests from libraries for volumes or numbers of the MONTHLY WEATHER REVIEW for the earlier years, 1873–1893, in order to complete sets that are accessible to the public and are frequently used. Those who have such early numbers to dispose of will confer a favor by notifying the Editor.—*C. A.*

THE STATION AT PORT AU PRINCE, HAITI.

Mr. R. E. Pollock, Assistant Observer, Weather Bureau, reports under date of July 16, 1905, that he has established a Weather Bureau station at the observatory of the Institution Saint Louis de Gonzague, Port au Prince, Haiti, and has

given the necessary instructions to the Professor of Physical and Natural Sciences, Frère Constantin, who will have charge of the work.

Mr. Pollock reports that the wind vane and anemometer support has been placed on the brick roof of the observatory of the college and that the exposure is an excellent one. The foundation for the support is of solid mahogany blocks buried in cement to a depth of about ten inches and is so firm that it is expected to withstand the strongest wind. In the observatory are many modern well-kept instruments.

A SEVERE HAILSTORM AT GRAND RAPIDS, MICH.

Mr. C. F. Schneider, Section Director, Grand Rapids, Michigan, reports as follows in regard to the hailstorm of Thursday, May 4, 1905:

Severe thunderstorm. First thunder heard at 1:20 p. m., central standard time; last at 6:45 p. m. Storm came from the southwest. Excessive rain from 1:40 to 2:20 p. m., accompanied from 1:46 to 1:56 p. m. by the most violent and copious fall of hail ever known to have occurred in this vicinity. The hail fell without cessation for fully ten minutes, almost completely covering the ground. The stones were particularly large, most of them being from one to two inches in diameter and some slightly larger than two inches. The storm passed over the central portion of the city, there being but little rain and no hail in the extreme western and eastern sections. Considerable damage was done by the hail, the greenhouses being especial sufferers. Nearly all skylights and many windows in residences and churches within the storm's path were broken. Precipitation to the amount of 0.79 inch fell between 1:40 and 2 p. m., most of it falling between 1:50 and 2 p. m.

The above has been held for some time hoping to obtain data that will enable us to define the length and width of the area covered by hail, but as the only other detailed reports at hand also come from Grand Rapids, we may infer that the hailstorm did not cover any very large area in the central portion of lower Michigan. The following are additional stations in lower Michigan reporting hail on the fourth of May: Grand Haven, light hail between 5:10 and 6:05 p. m.; Hagar, hail and thunder, between 5:30 and 6:15 p. m.; Reed City, hail and thunder, between 1:30 and 2:45 p. m.; Stanton, hailstorm, between 12:30 and 3:00 p. m., did very little damage; Webberville, hard electric storm with hail, between 4:20 and 6:50 p. m.

Heavy thunderstorms were reported from nearly all sections of lower Michigan on the above date, but the falls of hail were apparently confined to small and widely scattered areas.

METEOROLOGICAL COURSE AT WILLIAMS COLLEGE.

In the MONTHLY WEATHER REVIEW for November, 1904, page 517, the course in meteorology at present maintained at Williams College was briefly described. As there stated a lithographed syllabus, covering both text-book and lectures, is closely followed. Chapters VI to VIII, inclusive, of this syllabus were published in the MONTHLY WEATHER REVIEW for April, 1905, page 159, after being somewhat revised by the author, and Chapters I to V are now published so that teachers and lecturers may have the advantage of examining the whole work. The numbers on the right-hand side refer to the sections of Davis's Elementary Meteorology, which is the chief book of reference used by Professor Milham, and which is followed quite generally as a text-book.

A COURSE OF INSTRUCTION IN METEOROLOGY AT WILLIAMS COLLEGE.

Chapter I. Introduction—the atmosphere.
II. Heat of the atmosphere.
III. The observation and distribution of atmospheric temperature.
IV. The pressure and circulation of the atmosphere.
A. The observation and distribution of pressure.
B. The observation and distribution of the winds.
C. The convectional theory and its comparison with the observed facts.
D. A general classification of the winds.
V. The moisture of the atmosphere.
A. The water vapor of the atmosphere.
B. Dew, frost, fog.
C. Clouds.
D. Precipitation.
VI. The secondary circulation of the atmosphere.
A. Tropical cyclones.
B. Extratropical cyclones.
C. Thundershowers.
D. Tornadoes.
E. Waterspouts, whirlwinds.
F. Cyclonic and local winds.
VII. Weather bureaus and their work.
VIII. Weather prediction.
IX. Climate.
X. Floods and river stages.
XI. Atmospheric electricity.
XII. Atmospheric optics.
XIII. Atmospheric acoustics.

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